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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/801,405	03/08/2001	Ichiro Kasai	15162/03340	2892

24367 7590 08/28/2003

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EXAMINER

AMARI, ALESSANDRO V

ART UNIT PAPER NUMBER

2872

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/801,405

Applicant(s)

KASAI ET AL.

Examiner

Alessandro V. Amari

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-10, 12-28, 30 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6, 12, 13-27 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7-10, 28 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 March 2003 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, 9-10, 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Upatnieks US Patent 4,711,512 in view of Spitzer US Patent 5,886,822.

In regard to claim 1, Upatnieks discloses (see Figures 1, 3) an information display device comprising: an image display member (108) which displays images; and a prism (114) having at least two reflecting surfaces (304, 306) arranged in facing each other, and a plane hologram surface (302) formed of a reflection-type hologram as described in column 4, lines 53-58, and at least one of the two reflecting surfaces arranged in facing each other is a light-beam-selective surface which selectively

Art Unit: 2872

transmits or reflects light, wherein an image light beam that corresponds to image information and that exits from the image display member is reflected between the two reflecting surfaces arranged in facing each other, and is diffractively reflected on the hologram surface, and then, after being transmitted through the light-beam-selective surface, is directed to an observer's pupil as shown in Figures 1 and 3. Regarding claim 2, Upatnieks discloses that the hologram is a volume hologram as described in column 4, lines 53-66. Regarding claim 3, Upatnieks discloses that the hologram is a phase hologram as described in column 4, lines 53-66. Regarding claim 5, Upatnieks discloses that the hologram has a diffractive reflection angle wider than a regular reflection angle observed on the hologram surface as shown in Figure 3 and as described in column 3, lines 11-41. Regarding claim 9, Upatnieks discloses that the reflecting surfaces arranged in facing each other are substantially parallel to each other as shown in Figure 3. Regarding claim 10, Upatnieks discloses that the reflection occurring between the reflecting surfaces arranged in facing each other is total reflection as described in column 3, lines 19-37. In regard to claim 28, Upatnieks discloses (see Figures 1 and 3) an optical element comprising: two reflecting surfaces (304, 306) arranged in facing each other, and at least one of the two reflecting surfaces is a light-beam-selective surface that selectively transmits or reflects light; and a hologram surface (302) formed of a reflection-type hologram as described in column 4, lines 53-58, wherein light entering the optical element is reflected on the two reflecting surfaces, and after being reflected on the hologram surface is transmitted through the light-beam selective surface and then exits therefrom as shown in Figures 1 and 3.

Art Unit: 2872

Regarding claim 30, Upatnieks discloses that the optical element is a prism as shown in Figure 3 and as described in column 4, lines 38-44.

However, in regard to claims 1 and 28, Upatnieks does not teach that the hologram has positive optical power for projecting an image on an observer's pupil, while enlarging it.

In regard to claims 1 and 28, Spitzer does teach that the hologram has positive optical power for projecting an image on an observer's pupil, while enlarging it as described in column 12, lines 12-19.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a hologram with positive power as taught by Spitzer in the information display device of Upatnieks in order to permit the hologram to be placed at a wider range of angles to provide for a more flexible optical design.

4. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Upatnieks US Patent 4,711,512 in view of Spitzer US Patent 5,886,822 and further in view of Iizuka et al. U.S. Patent 6,049,429.

Regarding claims 7 and 8, Upatnieks in view of Spitzer teaches the invention as set forth above but does not teach a deflection correction member for correcting deflection of external light that is transmitted through a prism and that the deflection correction member is attached to the prism, and has surfaces on the same surfaces of the reflecting surfaces arranged in facing each other.

Regarding claim 7, Iizuka et al. does teach (see Figure 4) a deflection correction member (11) for correcting deflection of external light that is transmitted through a prism as described in column 8, lines 20-23.

Regarding claim 8, Iizuka et al. does teach that the deflection correction member is attached to the prism as shown in Figure 4, and has surfaces on the same surfaces of the reflecting surfaces arranged in facing each other as shown in Figure 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the deflection correction member of Iizuka et al. in the device of Upatnieks in view of Spitzer in order to correct for prism aberrations.

Allowable Subject Matter

5. Claims 6, 12, 13-27 and 32 are allowed.

6. Claim 6 is allowable over the prior art since the prior art fails to teach or reasonably suggest, "the reflecting surfaces arranged in facing each other have an inclination opening toward the incident side of a prism of the image light beam" as set forth in the claimed combination.

Claim 12 is allowable over the prior art since the prior art fails to teach or reasonably suggest, "at least one of the two reflecting surfaces arranged in facing each other is a curved surface" as set forth in the claimed combination.

Claims 13 and 32 are allowable over the prior art since the prior art fails to teach or reasonably suggest, "a second prism having the same construction as the first prism, wherein an image light beam corresponding to the information of the first image exiting from the first image display member is reflected between the two reflecting surfaces of

Art Unit: 2872

the first prism arranged in facing each other, and is reflected on another reflecting surface of the first prism, and then, after being transmitted through the light-beam-selective surface, is directed to an observer's pupil, on the other hand, an image, light beam corresponding to the information of the second image exiting from the second image display member is reflected between the two reflecting surfaces of the second prism arranged in facing each other, and is reflected on another reflecting surface, and then is, after being transmitted through the light beam-selective surface, directed to the same observer's pupil as the light beam of the first image" as set forth in the claimed combination.

The prior art of record, Upatnieks teaches an information display device or an optical element comprising an image display member which displays images; and a prism having at least two reflecting surfaces arranged in facing each other, and a plane hologram surface formed of a reflection-type hologram, and at least one of the two reflecting surfaces arranged in facing each other is a light-beam-selective surface which selectively transmits or reflects light, wherein an image light beam that corresponds to image information and that exits from the image display member is reflected between the two reflecting surfaces arranged in facing each other, and is diffractively reflected on the hologram surface, and then, after being transmitted through the light-beam-selective surface, is directed to an observer's pupil. However, the prior art does not teach that the reflecting surfaces arranged in facing each other have an inclination opening toward the incident side of a prism of the image light beam or that at least one of the two reflecting surfaces arranged in facing each other is a curved surface or comprises a

Art Unit: 2872

second prism having the same construction as the first prism wherein the light is transmitted through the first and second prisms from first and second image display members, respectively, and the second image light is directed to the same observer's pupil as the light beam of the first image member.

Response to Arguments

7. Applicant's arguments with respect to claims 1-3, 5, 7-10, 28 and 30 have been considered but are moot in view of the new ground(s) of rejection.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava-*AVh*
14 August 2003


MARK A. ROBINSON
PRIMARY EXAMINER